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FOURTH COORDINATION CONFERENCE AT NIULF

- USSR -

by N. N. Mel'nikov

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FOURTH COORDINATION CONFERENCE AT NIUIF
[Scientific Research Institute of Fertilizers and Insectifriges]

[This is a translation of an article written by N. N. Mel'nikov in Zashchita Rasteniy ot Vreditel'ey i Bolezney (Protection of Plants from Pests and Diseases), No. 3, Moscow, March 1960, pages 60-61.]

From 8 to 11 December 1959, the Fourth All-Union Conference on the coordination of research and development of chemical means of plant protection and weeds control was held in Moscow. Participating in the Conference were representatives of the scientific research organizations of the State Committee of the Council of Ministers USSR on chemistry, Ministry of Agriculture USSR, VASKNIL, Academy of Sciences USSR and allied republics, plants, and other organizations.

Reports on the problems of chemists in meeting the growing tasks of agriculture and on plans for 1960 which had been carried out were submitted by V. V. Kosov (State Inspection on Quarantine and Plant Protection of the Ministry of Agriculture USSR), N. N. Mel'nikov, Yu. N. Bezobrazov, S. F. Bezuglyy, L. I. Korolev, K. A. Gar, M. A. Morozova (NIUIF), Ye. V. Sergeyev, N. A. Gol'dberg (GIAP), A. V. Kirsanov (IOKh Acad Sci UkSSR), V. P. Vasil'yev (IZR UkSSR), and A. I. Kulikov (VIZR -- All-Union Institute of Plant Protection), etc.

V. P. Vasil'yev dwelt on the results of study of chemical means of combatting the garden-beet weevil. Better results were obtained with heptachlorine and polychlorpinene against the common as well as the gray weevils. According to preliminary data, all other poison-chemicals of the diene synthesis are surpassed by preparation No 948 suggested by NIUIF; of the phosphororganic chemicals, preparation K-2035 (suggested by Prof. A. V. Kirsanov) was distinguished by its high selective effect on the garden beet weevil, and by its virtual harmlessness to humans and warmblooded animals. As an insecticide of systemic action, it protects the shoots of the sugar-beet from pests for about 10 days. Of greater interest is its homologue-avenine- which is even more effective against the weevil and is also harmless to humans. The disadvantage of these compounds is their weak effect on other garden beet pests. Still, the limited selective-action preparations should find wide use in practice, because they are harmless to useful insects and do not disturb the normal symbiosis.

The heads of NIUIF laboratories reported on the new projects on the Institute. In 1959 about 500 compounds were studied; of these

some proved to be very effective. Of primary interest, hexachlorbutadiene must be singled out as having been successfully tested for two years in Moldavia against phylloxera. In the strength and duration of its action it exceeds all known poisons. The problem of mass production is being considered at the present time. Phosphororganic insecticides and those of the sevin type will be tested during the current year in the scientific research agricultural institutions; it is hoped that they will be only slightly toxic to animals, will be of the rogor type, systemic, with brief -- seven to eight days -- periods of action. There have also been discovered new classes of phosphororganic insecticides of assymmetric tetraalkyldithiopyrophosphates and alkylarylchlorthiophosphates. Deserving special mention is the study of the mechanism of action of the phosphororganic insecticides. The synthesis and investigation of a large number of new compounds has made it possible to demonstrate that the hypothesis of action of phosphorus compounds, accepted to the present, is not general and that a number of phosphororganic preparations do not comply with it. From the development and study of many fungicides, a number of new effective grain-seed mordants has resulted, including organic compounds of tin, phenanthrenquinone, halodinitrofluorbenzene, organic arsenic compounds, and many others. Of herbicides, defoliants, desiccants, and their analogues, there is a promising large group of triazines, derivatives of pentachlorodiene acid, aryloxybutyric acid, bis (alkylsantogen) polysulfides, derivatives of hydroxylamine, etc. Of the triazines, particularly interesting are: simazin (bis/ ethylamine-chlorotriazine) and chlorazine, simazin -- in combatting weeds in corn planting, and chlorazine -- those of cotton. The pentachlorodiene acid manifested itself not only as a contact herbicide, but as a defoliant and desiccant as well. A study has also been completed of slightly volatile 2, 4-D esters which are recommended for practical use.

Parallel with research in NIUIF, technological studies are also carried out on the development of methods of obtaining preparations, for example, of hexachlorcyclohexane, technical gamma-isomer and lindane, hexachlorbutadiene, "Kaptan" analogues, [mercaptan?], new mordants, simazine and chlorazine, aryloxyalkyl-carbonic acids, 2,4-D esters and amino-salts, derivatives of carbamic acid and urea, pentachlorodiene acid and its derivatives, etc. Work has been completed on complex-action preparations for the treatment of seeds of various crops with a mordant on the basis of TMTD and gamma-GKhTsG, heptachlorine, dil'drin, hexachlorbenzene with gamma-GKhTsG and Heptachlorine, trichlorphenolate of copper with gamma-GKhTsG, and heptachlorine. Their manufacture will start within the next few years.

Prof. A. V. Kirsanov spoke of new directions in the synthesis of phosphororganic insecticides and the study of type K-2035

preparations and avenin. A. I. Kulikov reported on VIZR research. A large group of esters of substituted aryl-esters of methylcarbamic acid deserves special mention -- (sevin-type preparations) among which was found a number of interesting active insecticides prepared with available raw material. To combat rust and other diseases, various organic derivatives of sulfuric and sulfamic acids were investigated; some were found to be effective; and a large group of nickel-containing substances was synthesized.

Ye. V. Sergeyev reported on the synthesis of izophen, butophen, and press rations such as tedion, keltan, etc. in his laboratory.

Interesting work, according to Comrade Prilezhayeva, is being conducted at the IOKh [Institute of Organic Chemistry] of the Acad. Sci USSR on obtaining various derivatives of sulfides and sulfones by diene synthesis from hexachlorocyclopentadiene; on obtaining bicycloheptadiene and hexachlorobicycloheptadiene, essential for the manufacturing of insecticides such as aldrin, dil'drin, isodrin, and endrin (A. F. Plate); and on the synthesis of possible metabolites of M-81 and No 74 preparations. In the Institute of Elemento-organic Compounds, projects, begun several years ago, continue on synthesis of various mixed esters of thio-dithiophosphoric acids and thiophosphinic acids (M. A. Kabachnik).

N. A. Gol'dberg submitted a brief report on the method of obtaining free cyanamide (defoliant) stabilized by means of boric acid. Prof. M. S. Malinovskiy reported on the synthesis of new mercury phosphor-organic compounds -- seed mordants -- distinguished by their marked effectiveness. B. G. Boldyrev reported that the esters of various thiosulfacids synthesized in the L'vov Polytechnic Institute contained a great variety of ester radicals. This group of compounds possesses high fungicidal and bactericidal activity and in some instances stimulates the growth of plants. Further study of this group will be undertaken.

The Conference adopted a detailed resolution forming the basis for a general plan of chemistry research in 1960.



In the Presidium of the Conference (left to right:
Prof. A. V. Kirsanov, Prof. N. N. Mel'nikov, V. V.
Kosov, and Academician of the Ukrainian Acad. of
Agr., V. P. Vasil'yev.

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